

## Relative Weight of Finishing Phase Broiler Chicken Accessory Organs Given Drinking Water Containing Brown Seaweed Extract

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### Abstract

This study aims to determine the effect of using brown seaweed extract (*Sargassum crassifolium*) in drinking water on the accessory organs of finisher phase broiler chickens. The research used a Completely Randomized Design (CRD) with 4 treatments and 5 replications. Treatment consisted of levels of brown seaweed extract, namely 0% (0.00gr in 3L water), 5% (0.18gr in 3L water), 10% (0.37gr in 3L water), 15% (0.56gr in 3L water). The parameters measured were the weight of accessory organs consisting of the crop, heart, liver, pancreas, gizzard and spleen. The results of analysis of variance showed that the treatment of giving brown seaweed extract in drinking water had a very significantly different effect ( $P < 0.01$ ) on gizzard weight, pancreas weight, heart weight and crop weight, and had a significantly different effect ( $P < 0.01$ ) against heart weight and spleen weight. The results of the Honestly Significant Difference (HSD) test showed that administration of 15% seaweed extract resulted in the weight of the pancreas and spleen being very significantly ( $P < 0.01$ ) higher than without administration of seaweed extract; Without giving seaweed extract, the heart weight and crop weight were very significantly ( $P < 0.01$ ) higher than when giving 15% seaweed extract; Giving 5% seaweed extract resulted in a liver weight that was very significantly ( $P < 0.01$ ) higher than giving 15% seaweed extract. It can be concluded that the use of brown seaweed extract in finishing phase broiler chicken drinking water can be given up to 10% because it can maintain the weight of finisher phase boiler chicken accessories organs.

**Key words:** Broiler chickens, *Sargassum crassifolium*, accessory organs

### I. INTRODUCTION

Broiler chicken meat is a source of animal protein which makes a major contribution to fulfilling the nutrition of Indonesian people. Good chicken meat quality is closely related to rearing management. Good and correct maintenance management will affect livestock productivity. Maintenance management involves handling the health and sanitation of pens and livestock, as well as providing feed and drinking water. In order to get good meat production, quality nutrient intake is needed through feed or drinking water. One source of nutrition that can support livestock health is that which comes from waters such as brown seaweed.

Brown seaweed (*Sargassum crassifolium*) grows abundantly in Indonesian waters and has high economic value. Seaweed contains omega 3 fatty acids, vitamins, pigments, antioxidant and anti-bacterial activity as well as several bioactive components [1]. Seaweed also contains toxic substances, namely iodine and heavy metals, because seaweed takes nutrients from the sea. Based on its existing content, seaweed can be used in various fields, namely cosmetics, medicine, food, and has also begun to be used as a feed additive. Feed additives given through feed and drinking water consist of vitamins, minerals, antibiotics, probiotics, prebiotics and growth hormones [2].

The use of brown seaweed as a feed additive in drinking water for broiler chickens can produce good carcasses, because it has many bioactives which are antioxidant and antimicrobial which can replace the function of AGP (Antibiotic growth Promoter) in maintaining the health and performance of livestock which can affect the digestive system and will impact on livestock growth [3]. This seaweed is used through processing using the extraction method. The level of administration of brown seaweed extract in drinking water was studied and the parameters were feed consumption, drinking water consumption, carcass weight, carcass percentage and abdominal fat of finisher phase broiler chickens.

### II. RESEARCH MATERIALS AND METHODS

### *Research Materials*

The chickens used were 60 Lohman strain (MB 202) Unsexed broiler chickens aged 21 days with an average initial body weight of 1,190 kg. The cages used are individual cages made from bamboo partitions and plywood with dimensions of 35cmx60cmx40 cm, which are equipped with feed and drinking water containers. This research uses 20 cage units and each cage will house 3 chickens.

### *Trial Rations and Drinking Water*

The research was carried out for 7 weeks. Data collection was carried out when the chickens reached 21 days of age. In the first 2 weeks, food and drinking water adaptation is carried out, treatment is given when the chicken reaches 3 weeks of age. Feed is given twice a day, namely in the morning and evening, and for drinking water, 200ml of water containing the extract is given and when it is finished, add regular water.

The extraction process was carried out once for research purposes for 4 weeks. This research used a Completely Randomized Design (CRD) which consisted of four treatments giving brown seaweed extract with the following treatment structure: P0:0% RLC extract, P1:5% RLC extract (0.18g in 3L water), P2:10 % RLC extract (0.37gr in 3L water), P3:15% RLC extract (0.56gr in 3L water), Each treatment was repeated 5 times with experimental units consisting of 3 chickens.

Mixing the extract in drinking water is done every 3 days, which is adjusted to the average drinking water consumption needs of chickens. The steps for the brown seaweed extraction process are as follows:

1. Wash the brown seaweed using clean water,
2. Seaweed that has been washed then aired or dried in the sun but covered with a black cloth for one week,
3. Dried seaweed, finely ground into flour,
4. The sample that has become flour is then mixed with 95% ethanol in a ratio of 1:5
5. Stir well then put into a jar and macerate for 3x24 hours
6. After that, carry out a second maceration by adding 95% ethanol in a ratio of 1:3 for 3x24 hours.
7. After maceration, filter using filter paper and pour into a petri dish to put in the oven at 40oC until the yield is obtained.
8. After that, remove the extract from the oven and weigh it, the yield is ready to use.

### *Research Rations*

The feed used is commercial feed for the starter and finisher phases.

### *Data analysis*

The data obtained were analyzed using diversity analysis using the Minitab program (version 16), for results that were significantly different, a further Honest Significant Difference (HSD) test was carried out.

### *Research Parameters*

The parameters measured were the weight of the accessory organs, namely: 1) weight of the crop, 2) weight of the heart, 3) weight of the liver, 4) weight of the pancreas and 5) weight of the spleen

## III. RESULTS AND DISCUSSION

### *A. Results*

The effect of giving brown seaweed extract in the drinking water of broiler chickens on accessory organs as measured by crop weight, heart weight, liver weight, pancreas weight, gizzard weight and spleen weight can be seen in Table 1.

Table 1. Average weight of accessory organs

Treatments	Variable					
	Crop	Heart	Liver	Pancreas	Gizzard	Spleen
P0	11,60 <sup>a</sup>	14,60 <sup>a</sup>	56,80 <sup>ab</sup>	6,40 <sup>c</sup>	28,80 <sup>b</sup>	2,40 <sup>c</sup>
P1	9,40 <sup>b</sup>	14,00 <sup>ab</sup>	57,80 <sup>a</sup>	6,60 <sup>bc</sup>	31,20 <sup>a</sup>	2,80 <sup>ab</sup>
P2	8,60 <sup>b</sup>	13,60 <sup>ab</sup>	57,00 <sup>ab</sup>	7,60 <sup>ab</sup>	32,80 <sup>a</sup>	3,20 <sup>ab</sup>
P3	8,40 <sup>b</sup>	13,00 <sup>b</sup>	55,20 <sup>b</sup>	8,20 <sup>a</sup>	31,60 <sup>a</sup>	3,40 <sup>a</sup>
P Value	<0,0001	<0,008	<0,037	<0,001	<0,0001	<0,028
MSE	0,2915	0,2828	0,5745	0,2828	0,4690	0,2236

<sup>a,b</sup> Means in the same row with different letters show differences ( $p < 0.05$ ). P0:0% RLC extract (0.00g in 3L water), P1:5% RLC extract (0.18g in 3L water), P2:10 % RLC extract (0.37gr in 3L water), P3:15% RLC extract (0.56gr in 3L water),

From table 1 it can be seen that the weight of the crop organ ranges from 8.40 grams obtained when drinking water containing 15% brown seaweed extract to 11.60 grams obtained from drinking water without brown seaweed extract. The weight of the heart organ ranged from 13.00 grams obtained when drinking water containing 15% brown seaweed extract to 14.60 grams obtained from drinking water without brown seaweed extract. Liver organ weight ranged from 55.20 grams obtained when drinking water containing 15% brown seaweed extract to 57.80 grams obtained when drinking water containing 5% brown seaweed extract. The weight of the pancreas ranged from 6.40 grams obtained when drinking water without brown seaweed extract to 8.20 grams obtained from drinking water containing 15% brown seaweed extract. The weight of the gizzard organ ranged from 28.80 grams obtained when drinking water without brown seaweed extract to 32.80 grams obtained from drinking water containing 10% brown seaweed extract. The weight of the splenic organ ranged from 2.40 grams obtained when drinking water without brown seaweed extract to 3.40 grams obtained from drinking water containing 15% brown seaweed extract.

The results of the diversity analysis showed that drinking water containing brown seaweed extract had a very significantly different effect ( $P < 0.01$ ) on the weight of the crop organ, the weight of the heart organ, the weight of the pancreas organ and the weight of the gizzard organ; however, it had a significantly different effect ( $P < 0.05$ ) on the weight of the liver and the weight of the spleen.

### B. Discussion

Polyphenol and phlorotannin chemicals found in abundance in brown seaweed have the ability to activate pancreatic  $\beta$  cells, resuming insulin secretion and reducing appetite or food intake [4]. Inhibiting insulin secretion will raise blood sugar, which will lead to an increase in the consumption of rations. But when insulin is produced correctly—in this case, with the help of phlorotannin and polyphenols—it will control glucose as an energy source and make cattle feel full. Livestock will stop consuming rations when they believe they have enough energy needs [4]. The biggest determinant of life weight is the surroundings. For their bodies to function at their best, broiler chicks require a proper atmosphere.

Natural antioxidants found in brown seaweed, such as fucoxanthin, phlorotannins, and polyphenols, are important in lowering body fat [5]. Fucoxanthin has the potential to increase fat reduction by 10%. Fucoxanthin has cell reinforcement and antiobesity impacts, which will essentially lessen plasma and

liver fatty oil levels, and decidedly impact cholesterol-affecting proteins, and can decrease the declaration of compounds that catalyze unsaturated fat amalgamation [6].

In birds the liver is the biochemical manufactory capable basically for the union, digestion, discharge, and detoxification processes, and is keen on a few metabolites and homeostatic capabilities. It invigorates the processing and digestion, directing the creation, stockpiling, and arrival of carbs, lipids and proteins [7]. The liver brings out enhancement of proteins, including catalysts, chemicals, parentage proteins, coagulation factors and unsusceptible variables. This exhibits that the treatment of conduct towards with increase uronic sulfuric acid extricated from *S. crassifolium* in drinking water doesn't contain poisonous substances that can cause the liver to become extreme. One of the elements of the liver is the detoxification of poisons and in the event of irregularities in the liver showed by an augmentation or decrease of the liver.

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The pancreas is the organ that capabilities in stomach related framework and situated close to the gastrointestinal system. The pancreas was accounted for to deliver the chemicals which hydrolyze each extensive supplements into immaterial monomers that lighten be wrapped into the parentage or lymph [10]. The lean is the central unsusceptible instrument of parturition pullets, and its near vernacular haul was impacted by the medicines. Any progressions in the similar tongue heave of this organ in laying pullets separately on the grounds that took care of various anti-toxin sources. By and large, feed consumption without anti-infection agents with a degree of uronic corrosive removed from *S. crassifolium* in drinking water would in general be higher than feed consumption with anti-toxins [11].

#### IV. CONCLUSION

Based on the results of data analysis, it can be concluded that the use of brown seaweed extract in broiler chicken drinking water can be given up to 10% because it can still maintain the weight of accessory organs, so they can function normally.

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